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# Can economic uncertainty, financial stress and consumer sentiments predict U.S. equity premium?

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ABSTRACT

This article attempts to examine whether the equity premium in the United States can be predicted from a comprehensive set of 18 economic and financial predictors over a monthly out-of-sample period of 2000:2–2011:12, using an in-sample period of 1990:2–2000:1. To do so, we consider, in addition to the set of variables used in Rapach and Zhou (2013), the forecasting ability of four other important variables: the US economic policy uncertainty, the equity market uncertainty, the University of Michigan's index of consumer sentiment, and the Kansas City Fed's financial stress index. Using a more recent dataset compared to that of Rapach and Zhou (2013), our results from predictive regressions show that the newly added variables do not play any significant statistical role in explaining the equity premium relative to the historical average benchmark over the out-of-sample horizon, even though they are believed to possess valuable informative content about the state of the economy and financial markets. Interestingly, however, barring the economic policy uncertainty index, the three other indexes considered in this study yield economically significant out-of-sample gains, especially during recessions, when compared to the historical benchmark.

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## 1. Introduction

A considerable number of studies have dealt with predictability of stock market returns, using different predictors and methods (e.g., Avramov, 2002, 2004; Ang and Bekaert, 2007; Boudoukh et al., 2008). This long literature forecasts market returns using price multiples, corporate actions, measures of risk, and macroeconomic variables (see, e.g., Rapach et al., 2005; Gupta and Modise, 2012a,b for a brief review of this literature). Most of these studies find evidence in favor of return predictability in the in-sample forecasts (e.g., Campbell, 1999, 2000). Others find that certain components of the stock market returns have different time series persistence which facilitates return predictability (Rapach et al., 2011), but other components are difficult to forecast (Ferreira and Santa-Clara, 2011).

The in-sample forecastability behavior can be explained by specific factors related to market microstructure including transactions costs, information asymmetry, and agent heterogeneity (e.g., long-term investors, speculators, and hedge funds), among others. Several studies question the stock market predictability on the basis that the persistence of

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forecasting variables and the correlation of the innovations of these variables with returns may bias the regression parameters and consequently impact their *t*-statistics (Stambaugh, 1999; Lewellen, 2004). Moreover, the results of this research strand contradict the weak form of the efficient market hypothesis (Fama, 1970, 1991), which states that asset prices fully and instantaneously reflect all available information so that no traders can consistently earn abnormal profits by speculating in the futures prices.[1] Another problem with the in-sample return predictability includes the use of a long list of spurious predictors such as the football results, the hemlines, and butter production in Bangladesh (e.g., Foster et al., 1997; Ferson et al., 2003; Ferreira and Santa-Clara, 2011), which have no fundamental or technical relations to stock markets. The predictability record is however not as successful in the out-of-sample forecasts. For example, Goyal and Welch (2008) find the historical mean has a better out-of-sample return predictability than the conventional predictive regressions. Therefore, the dust is not settled on the predictability of stock market returns and the jury is still out on this issue.

The actual evolution of international financial markets suggests that the economic policy uncertainty, financial stress, and consumer sentiment variables may serve as more encouraging predictors under the context of frequent crises and financial distresses. These variables, being related to both systematic and systemic risks, may define the stock market environment better than the traditional predictors, thereby would help to predict stock market returns over the in- and out-of-sample periods. While they convey information related to the general economic and financial conditions, their connection to stock markets and return forecastability has not been adequately investigated. With the on-going substantial volatility and financial stress in the US economy, the risk, stress and uncertainty have largely contributed to economic downturn and fluctuations in the financial markets. The rational asset pricing theory postulates that stock return predictability can emerge from exposure to time-varying aggregate risk. To the extent that successful forecasting models consistently arrest this time-varying aggregate risk premium, they will likely stay successful as time goes on. Having said all that, it is opportune to state that the predictability of stock market returns still remains an open issue and deserves more scrutiny and investigation.

The main contribution of this study is to examine the predictability of the equity premium, defined as the return on the S&P 500 (including dividends) less the return on a risk-free bill (interest rate on the three-month Treasury bill) over a monthly out-of-sample period from 2000:2 to 2011:12, using an in-sample period from 1990:2 to 2000:1 based on a more comprehensive set of economic and financial predictors. We further investigate the forecasting ability of the considered variables over the NBER-dated business-cycle expansion and recession subperiods. Compared with Rapach and Zhou (2013), we use a more updated dataset than the one used by these authors and employ four additional predictors which have not been considered in the related literature. These predictors include the US economic policy uncertainty index, the equity market uncertainty index, the University of Michigan's index of consumer sentiment, and the Kansas City Fed's financial stress index. While considering the traditional predictive variables as the baseline scenarios, our study helps to discern whether these new risk, economic policy, equity uncertainty, and consumer sentiment measures have more out-of-sample forecasting power than the traditional measures such the price multiples, firm characteristics, and macroeconomic variables. If stock market returns can be predicted more accurately after the introduction of these new predictors, the generated forecasts will not only help in the construction of relevant investment strategies in advance, but also convey important information to policymakers in order to appropriately design economic policies to avoid the unexpected outcomes during policy implementation phases.

Surprisingly, we find that the newly added variables do not play any significant statistical role in explaining equity premium relative to the historical average benchmark over the out-of-sample horizon, even though these variables are believed to possess valuable informative content about the state of the economy and financial markets. Interestingly, however, barring the economic policy uncertainty index, the three other indexes considered in this study yields economically significant out-of-sample gains, especially during recessions, when compared to the historical benchmark. Even though the new indexes do not significantly forecast stock returns, the obtained results would help an investor who has access to available information on those new predictors to better forecast stock returns over the out-of-sample period, besides using the standard predictors.

The remainder of this article is organized as follows. Section 2 offers a short review of the relevant literature. Section 3 introduces the empirical methodology and forecasting evaluation criteria. Section 4 presents the data. Section 5 reports and discusses the obtained results. Section 6 concludes the article.

## 2. Related literature

The early literature de-emphasizes the importance of fundamentals in predicting market (excess) returns in the out-of-sample forecasts.[2] Meese and Rogoff (1983) find that predictive regressions on economic and financial fundamentals such as interest rate differentials cannot outperform the random walk approach in the out-of-sample forecasts. More recently, authors such as Burnside et al. (2007, 2008) show that buying high interest rate and shorting low interest rate currencies can produce consistent profits. Goyal and Welch (2008) investigate the out-of-sample return predictability of a long list of

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[1] This speculative efficiency hypothesis which involves both the spot and futures markets implies that futures prices constitute the best unbiased forecasts of future spot prices plus or minus a time-varying risk premium. Thus, speculators cannot earn abnormal profits.

[2] Ferreira and Santa-Clara (2010) include in footnote 1 a comprehensive list of the studies and the fundamental variables that authors of these studies use over the years. The reader is advised to refer to this list, as well as to Rapach and Zhou (2013).

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